Analysis of Massachusetts Hate Crimes Data

An Overview of Reported Hate Crimes in Massachusetts Between 2000 and 2009

Deval L. Patrick, Governor
Timothy P. Murray, Lieutenant Governor
Mary Elizabeth Heffernan, Secretary of Public Safety and Security

Report prepared by:
Massachusetts Executive Office of Public Safety and Security
Office of Grants and Research
Research and Policy Analysis Division
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Author:

Alex Wagner, Data Coordinator
Drei Munar, Research Analyst

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If you have any questions regarding this report, please contact:

Alex Wagner
Research and Policy Analysis Division
Executive Office of Public Safety and Security
Office of Grants and Research
Ten Park Plaza, Suite 3720
Boston, MA 02116
Alexander.Wagner@state.ma.us

Executive Summary and Highlights

Reports of hate crime related incidents in the Commonwealth between 2000 and 2009 were analyzed utilizing data from the Massachusetts State Police Crime Reporting Unit (CRU). This report presents findings on the 3,648[1] hate crime incidents in Massachusetts over the ten-year period.

The CRU defines hate crimes as "any criminal act to which a bias motive is evident as a contributing factor. The Reporting Act covers bias on account of race, religion, ethnicity, handicap, gender, or sexual orientation. Hate crimes may be reported only by law enforcement agencies" (CRU,2006). The number of offenses, offenders, victims, and bias motivations may not coincide with the number of incidents or cases because each incident may consist of multiple offenses, bias motivations, victims, and offenders.[2]

Below are the key findings from our analyses.

- A trend analysis indicated there was a pronounced ten-year decline in reported hate crime incidents. This trend occurred across all bias categories (i.e., race/ethnicity, religion, sexual orientation, disability, and gender), as well as for all specific bias types within bias categories.[3]

- The year 2008 was an outlier in terms of the low number of overall reported hate crime incidents. Hate crime incidents rose between 2008 and 2009, however, the increase is not evident from 2007 to 2009.

- The vast majority of reported hate crimes (92.2%) only reported one bias motivation, while less than 1.5% of all reported hate crimes reported more than two bias motivations.

- The three most frequent bias motivation categories were based on race/ethnicity (58.3%), sexual orientation (21.5%), and religion (18.6%). Just these three bias motivation categories accounted for 98.3% of all hate crimes. This was generally consistent with research findings from other states and across the nation.

- The three most frequent within-bias motivation types for hate crimes were Anti-Black (31.7%), Anti-Gay (male, 17.5%), and Anti-Semitic (13.5%), again generally consistent with other research findings.

- White hate crime victims were more common than any other racial/ethnic background (52.3%), as opposed to victims from other race/ethnic groups: black (29.8%), Hispanic (7.1%), Asian (6.4%) or other (4.3%).

- Between 2000 and 2009, a third of hate crime victims were between the ages 16 and 25 (29.4%), whereas victims over the age of 25 accounted for more than 40 percent of hate

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[1] This number is based on the number of hate crimes reported by Massachusetts law enforcement agencies.
[2] The FBI defines an "incident" for the purposes of NIBRS reporting as "...one or more offenses committed by the same offender, or group of offenders acting in concert, at the same time and place..." (FBI, 2000).
[3] Trend analysis was performed on within-bias categories only when there were enough data points to accurately determine the trajectory.

crime victims (20.5% of victims were 36 to 45 and 20.2 percent were 26 to 35). Victims aged 10 and younger comprised the smallest fraction of reported hate crimes (2.1%).

Background, Data Overview, and Limitations

The collection of crime data, including hate crimes, is generally viewed as one of the most difficult challenges to criminal justice research (Maxfield, 1999; Shively and Mulford, 2007). This is primarily the result of crime data sources and measures having shortcomings, regardless of summary, survey, or incident type (Maxfield, 1999; Tillyer and Miller, 2009).

Massachusetts crime data is collected by the Massachusetts State Police Crime Reporting Unit (CRU). The CRU serves as the primary data repository for all state, local, and campus police departments and the Federal Bureau of Investigation (FBI). In 1995, the CRU was certified by the FBI as meeting their quality standards, only the ninth state crime data collection agency to-date to receive this honor. Collecting, maintaining, analyzing, and reporting crime data for the Commonwealth in under the purview of the CRU.

In 1990, Massachusetts began collecting hate crime data. Data is collected through two primary agencies: 1) the Uniform Crime Reporting (UCR) program and 2) the National Incident-Based Reporting System (NIBRS). The latter collects only data for select Massachusetts law enforcement agencies. Police departments that do not utilize NIBRS submit their precincts hate crime data on a separate reporting form. The CRU combines these different data sources into one database, which they generously shared with the Research and Policy Analysis Division (RPAD) for the purpose of this report.[4]

Previous researchers (Akiyama and Nolan, 1999; Bibel, 2010; Maxfield, 1999) have outlined the complexities of analyzing NIBRS data, including the misinterpretation of analysis findings. FBI staff expressed similar risks associated with NIBRS data, as well as the fact that the underlying multilevel data structure may mislead inexperienced researchers to present severely flawed research findings (Maxfield, 1999). It is essential to understand the limitations each data source presents on both efficacy and interpretation of crime statistics in general, and specifically on NIBRS based research.

These limitations, including that reported hate crime data are likely to be incomplete (Perry, 2001; McDevitt, Levin, and Bennett, 2002; Messner, McHugh and Felson, 2004) fully apply to the data utilized in this analysis. This is also the case with respect to the difficulty of establishing the bias motivation of the offender (Strom 2001; Shively, 2005) and the reliability of bias motivation coding in NIBRS (Maxfield, 1999; Roberts, 1997). Previous research (Perry, 2001; Messner, McHugh and Felson, 2004) does, however, concur that reported hate crime data still might be useful in terms of analyzing trends and patterns, including the relationship between variables. Conducting such research is especially important because quAntitative hate crime analysis has been relatively limited (Messner, McHugh and Felson. 2004). This reports attempts to contribute in this direction.

Massachusetts Hate Crime Form

The Massachusetts hate crime reporting form collects variables, including but not limited to within-bias type (i.e., race/ethnicity, religion, sexual orientation, gender, handicap), the offense

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[4] Experienced CRU personnel extracted the data from their database and provided RPAD with an SPSS data file to be used for the analysis conducted for this report.

committed, characteristics of the victim and offender, and weapon(s) used in committing the offense. All data and analysis depicted in this report is based solely on incidents reported to law enforcement agencies, recorded by law enforcement agencies, and then reported to the CRU by the respective law enforcement agencies. Hate crimes not reported or captured by the latter two were and could not be included in the current analysis.

Using data collected through the Massachusetts Hate Crime Reporting Form (for UCR reporters) and NIBRS crime data, RPAD analyzed hate crime offenses from 2000 to 2009. Crime reporting is not mandatory in the Commonwealth of Massachusetts and data was not available for all 351 cities/towns. However, crime data is submitted by the majority of agencies in the Commonwealth during the time period collected (approximately 86%), including large agencies such as Boston, Worcester, and Springfield.[5]

Hate Crime Analysis by Incident/Offense[6]

According to CRU data, there were 3,648[7] reported hate crime incidents in Massachusetts between 2000 and 2009. Figure 1 displays the total number of incidents. The number of incidents clearly fluctuated over the ten-year period: a low of 192 incidents in 2008 (a statistically significant outlier) and a high of 464 incidents in 2000. A basic trend analysis[8] exhibits a pronounced downward trend over the ten-year period, despite a substantial increase in reported hate crimes from 2008 to 2009 (47.39%). This increase, however, may have been partially due to the fact that the year 2008 was an outlier.[9] The numbers for 2009 decreased by 19.14% when compared to 2007.

Figure 1.

Hate Crime Incidents by Year, 2000 to 2009

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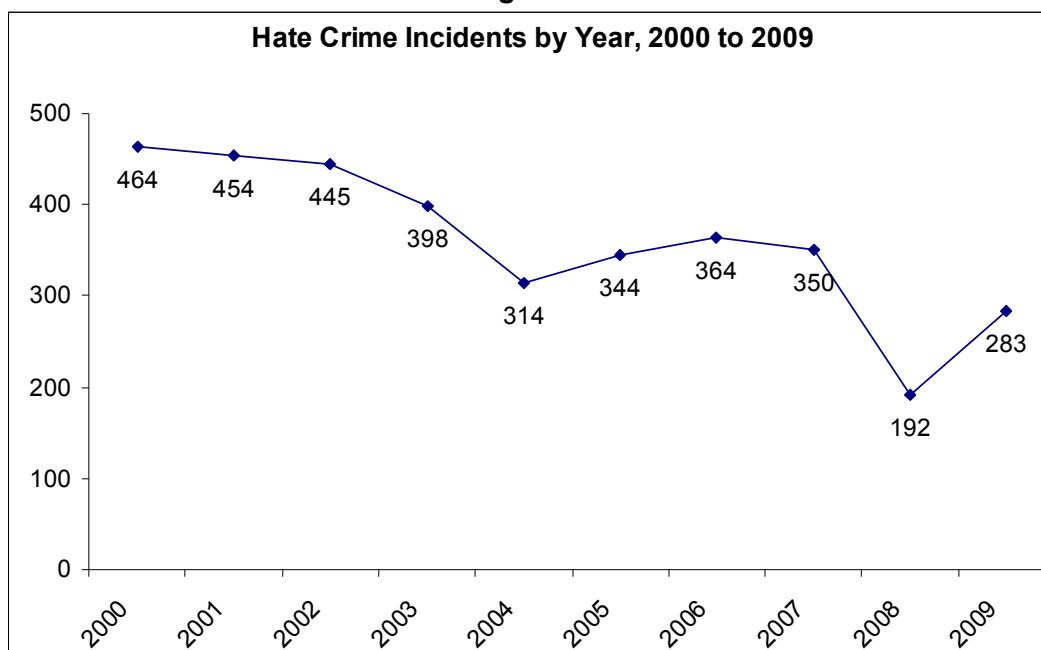
[5] Appendix A depicts the geographic distribution of hate crime incidents, by county, throughout the Commonwealth.
[6] Hate crime incidents can include multiple counts such as offenses, victims, offenders. Percentages therefore do not necessarily add up to 100%. Categorical counts and totals might exceed the total number of incidents.
[7] The CRU data also included 40 incidents for which years were not available. These incidents were not included in the temporal analysis.
[8] Simple linear regression. Slope = -24.303 (p =.001)
[9] z-score = -1.986 (p=.0239) shows 2008 to be a significant outlier on the low end.

Figure 1 displays only total number of hate crimes over the past ten years. As such, variations stemming from bias motivations are not apparent. The following figures address this issue. Hate crimes, as defined in Hate Crime Statistics Act, are crimes for which bias motivations are evident as contributing factors. The Reporting Act covers bias or prejudice in the categories of race/ethnicity, religion, disability, gender, or sexual orientation. Any trend analysis should therefore include a hate crime breakdown by bias motivations.

Hate Crime Offenses by Bias Motivations & Within-Bias Types

Massachusetts hate crime reports include data on bias types, which detail the basis for the offenses.[10] Individual incident reports also include within-bias types, such as Anti-Black, Anti-Gay (male), or Anti-Semitic. Each within-bias type is defined by the Reporting Act.

The top three bias categories for hate crimes in Massachusetts reported between 2000 and 2009 were race/ethnicity (58.3%), sexual orientation (21.5%), and religion (18.6%). These three bias motivations accounted for approximately 98.4% of all hate crimes reported during the ten-year time frame.[11] These percentages were generally consistent with past research (Messner, McHugh and Felson, 2004; Strom, 2001). Figure 2 illustrates the change in each bias category over the ten-year period.

Figure 2.

Top 3 Bias Categories by Year, 2009 to 2009

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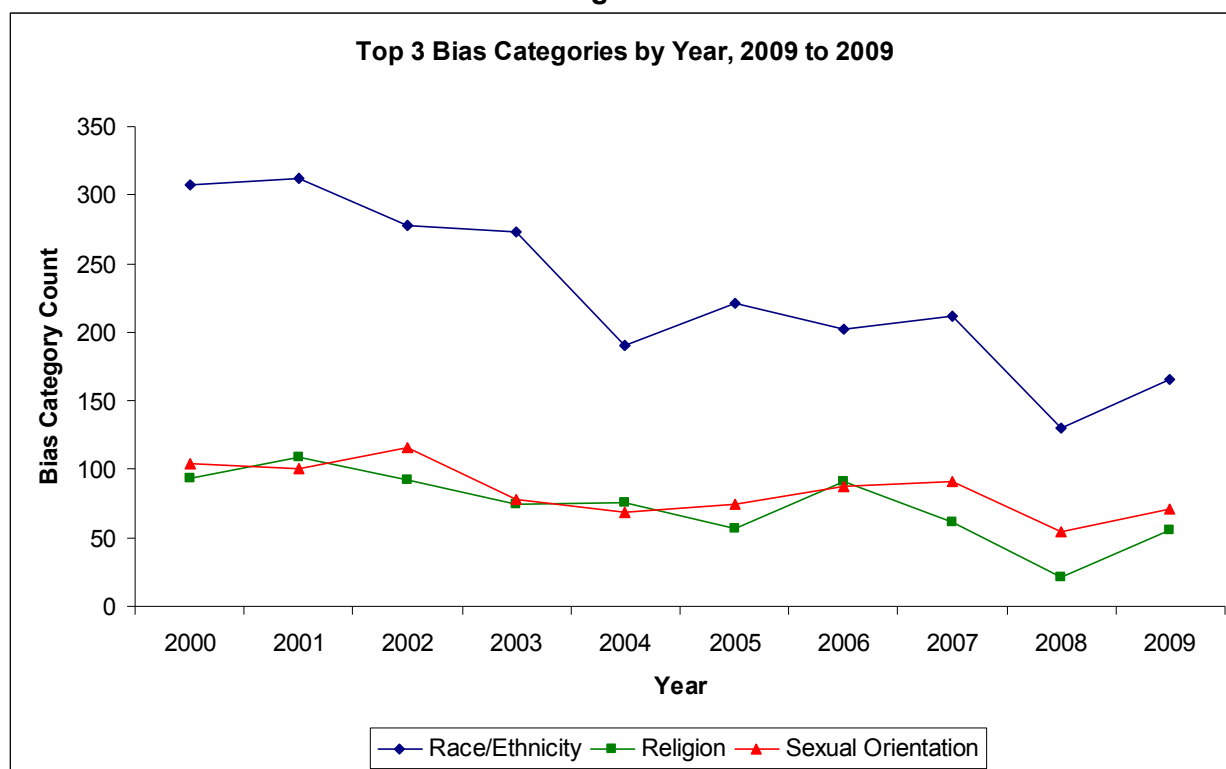
[10] A hate crime incident, however, might be based on more than one bias motivation. Still 92.2% of all reported incidents are based on a single bias motivation and an additional 6.4% are based on two bias motivations.
[11] Disability accounts for approximately 1.2 percent and gender accounts for approximately 0.4 percent of bias motivations.

The average number of reported offenses between 2000-2000 for racially or ethnically motivated hate crimes was about 229 offenses per year, followed by hate crimes motivated by sexual orientation bias and hate crimes motivated by religious bias, with about 85 and 73 offenses per year on average, respectively. Tests of group means showed that the number of racially/ethnically-motivated crimes were significantly higher during 2000-2009 than hate crimes not motivated by race/ethnicity. Likewise, findings showed that the number of hate crimes motivated by religion or sexual orientation were significantly higher during the ten-year period than hate crimes motivated by handicap or gender bias.

Comparing the number of hate crimes motivated by religion or sexual orientation to each other, however, did not show significant differences. Similar findings resulted when comparing hate crimes motivated by handicap and gender bias.[12] While there were differences in the mean number of hate crime types, these differences were not statistically significant.

Racially/ethnically-motivated hate crimes varied the most by far: almost 2.4 times more variation than hate crimes motivated by religious bias, whereas the variation in hate crimes motivated by religious bias was somewhat higher (1.36 times) than the variation in hate crimes motivated by sexual orientation.[13] The remaining hate crime categories (handicap and gender based) varied only relatively slightly.

The top three bias category motivations were also strongly correlated with each other.[14] Correlations do not indicate causality, however, rather they attest to the strength and direction of the linear relationship between two variables in pair-wise comparisons. The hate crimes during 2000 to 2009 therefore rose and fell to a large extent together.

In summary, trend analysis showed an overall decline of hate crimes for the top three categories over the ten-year time frame. The decline in race/ethnicity bias motivations was the most pronounced. It was about 2.8 times the decline in religion-based bias motivations, and about 4.3 times the decline in sexual orientation-based bias motivations.[15]

Despite this ten-year decline all top three bias motivations experienced increases between the years 2008 to 2009: race/ethnicity increased by almost 27%, religion by about 162%, and sexual orientation by 32%. It remains to be seen if these recent spikes represent the beginning of a new trend or whether it was at least in part due to 2008 being an outlier in terms of reported hate crimes. As noted before, comparisons of 2007 and 2009 numbers do not show such increases.

Specific Racial or Ethnic Bias Motivations

A closer look at the within-bias motivation types for the top three categories enabled us to gain a better understanding of the variation between within-type bias categories. Figure 3 depicts a breakdown of racial/ethnic bias motivations for the ten-year time frame. Consistent with previous

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[12] One-way ANOVA resulted in statistically significant overall group differences (F=89.306, Post Hoc Tukey-HSD showed significant mean differences among some groups at p < .05. See Appendix B).

[13] The standard deviations were 61.3 for race/ethnicity, 25.5 for religion, 18.7 for sexual orientation, 2.9 for handicap, and 1.8 for gender.

[14] For race/ethnicity and religion r=.830**, for race/ethnicity and sexual orientation r=.816**, and for religion and sexual orientation r=.811** (** denotes p<.01, all two-tailed).

[15] Slopes were -18.57 for race/ethnicity, -6.594 for religion, and -4.291 for sexual orientation, all significant at the .05 or lower level.

research (see Strom 2001), Anti-Black bias accounted for the vast majority of racially or ethnically motivated hate crimes (49.7%) followed by Anti-White (18.1%), Anti-Hispanic (12.5%), and Anti-Arab (7.1%).

Figure 3.

Specific Racial Bias Motivations between 2000 and 2009
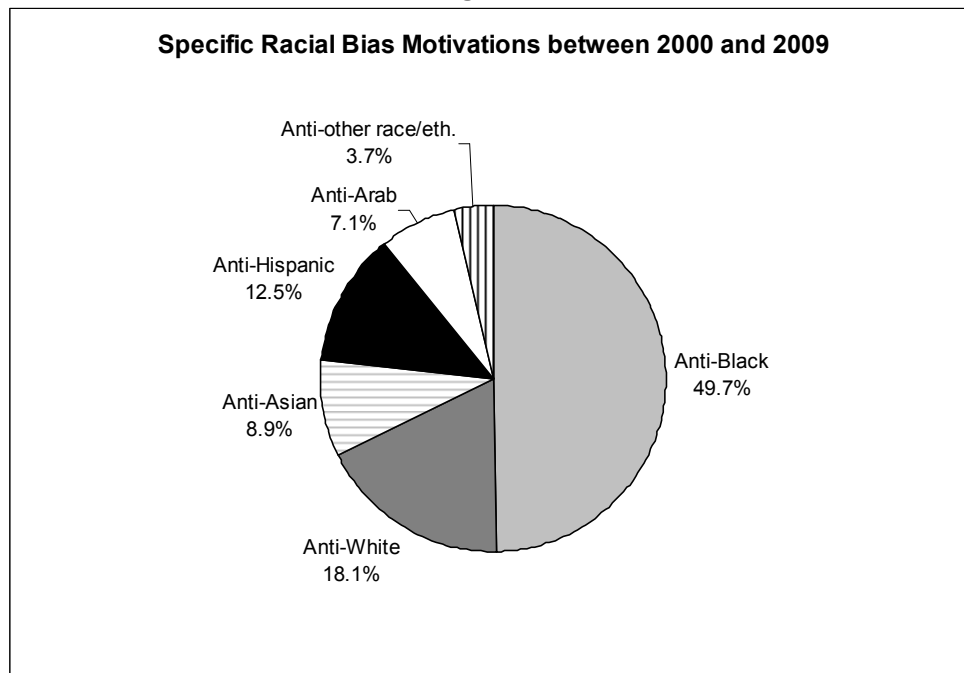
A trend analysis for each specific racial bias motivation indicated a ten-year decline for each reported specific racial bias motivation (Figure 4). The most pronounced ten-year decline was among Anti-Black hate crimes. This decline was almost double than any other race/ethnic group. Reported hate crimes labeled as "Anti-Other" declined at a rate of about half of the decline of Anti-Asian, Anti-Hispanic, and Anti-Arab bias motivated hate crimes. Reported Anti-White hate crimes declined negligibly over the ten-year time frame.

The mean number of reported hate crimes for Anti-Black offenses was the largest with all other race/ethnic groups averaging a considerably lower number of offenses - about 114 per year for Anti-Black, Anti-White (41), Anti-Hispanic (29), Anti-Asian (20), and Anti-Arab (16). Only the mean for Anti-Black hate crimes was significantly different from the means of the other racially or ethnically based hate crimes.[16] We were unable to make any conclusions about which means were larger or smaller for the other racial or ethnic categories, because the differences between the means were not statistically significant. The only exception, however, was between crimes motivated by an Anti-White bias and Anti-Other bias. Most of the means for hate crimes that were not Anti-Black fell within a typical range of variation. This is at least in part attributable to the relatively large variations in the number of hate crime offenses from year-to-year and even over the ten-year time frame. Anti-Black hate crimes showed the largest variations, followed by Anti-Arab and Anti-Asian hate crimes.[17] Anti-White and Anti-Other hate crime offenses varied the least from year to year.

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[16] One-way ANOVA showed significant overall group differences (F=56.636, Post Hoc Tukey-HSD showed significant mean differences among some groups at p=.05, Appendix C).
[17] Standard Deviations are 27.57, 17.36, and 15.75 respectively.

Figure 4.

Specific Racial Bias Motivations, 2000 to 2009
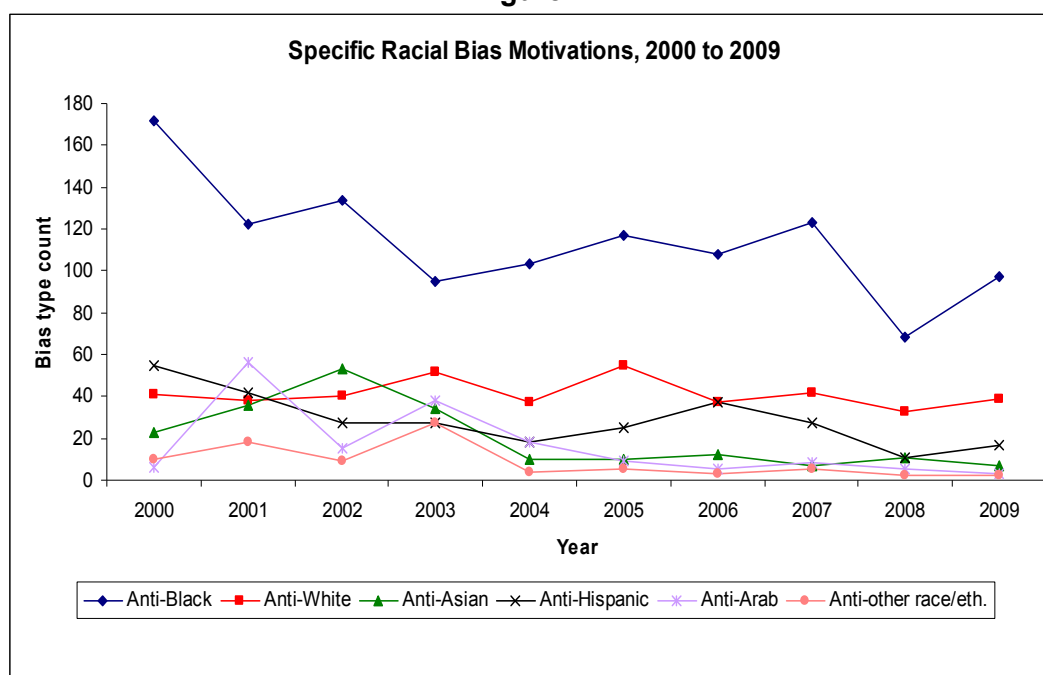
The trend analysis of within-bias types also exhibited an overall decline from 2000-2009, similar to the decline among all racially-based hate crimes. This decline was evident despite the general increase in racially-motivated hate crimes from 2008 to 2009. The increase, however, was not present among every within-bias racial type. While Anti-Hispanic (54.5%), Anti-Black (42.6%) and Anti-White (118.2%) hate crimes increased between 2008, hate crimes motivated by Anti-Arab and Anti-Asian sentiment declined by 40% and 36.4% respectively. No change occurred in reported Anti-Other hate crimes from 2008 to 2009.

The year 2008 was again an outlier for crimes motivated by Anti-Black bias. This was, however, not the case for any of the other racially motivated hate crimes in 2008.[18] Additional outliers for Anti-Black and Anti-Hispanic were the years 2000, 2001 for Anti-Arab, 2002 for Anti-Asian, 2003 for Anti-Other, and 2005 for Anti-White (all unusually high). The reasons for these spikes were not clear. The only spike we could explain was the dramatic increase in Anti-Arab hate crimes in 2001, which saw a substantial spike in reported offenses during September and October of that year, subsequent to the events of September 11, 2001.

Specific Sexual Orientation Bias Motivations

Hate crimes motivated by sexual orientation were reported in three categories; Anti-Gay (male), Anti-Lesbian, and Anti-Other sexual orientation. Anti-Gay hate crime offenses represented an overwhelming majority of sexual orientation based offenses (82%). Anti-Lesbian motivated crimes were less than a fifth of hate crimes based on sexual orientation (17.6%). There were only a total of four Anti-Other offenses reported over the ten year period, representing about 0.4% of all sexual orientation based offenses.

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[18] z-score = -1.66. All other 2008 z-scores fall in the normal range of variation, using p = .05 and one-tailed test criteria.

The mean number reported for Anti-Gay hate crimes was about 67 offenses per year and about 15 offenses per year for Anti-Lesbian offenses. There was, however, considerably more variation in Anti-Gay offenses per year than Anti-Lesbian and the differences were statistically significant.[19, 20]

Figure 5 illustrates the ten-year trend for reported Anti-Gay and Anti-Lesbian bias motivated hate crimes in Massachusetts. The trend analysis showed a decline for both forms of sexual orientation based hate crimes. Notably, the decline in Anti-Gay hate crimes was about three times larger than the decline in Anti-Lesbian hate crimes. Both bias motivations, however, increased from 2008 to 2009: Anti-Gay by more than a third (34.9%) and Anti-Lesbian by nearly a third (30%). Again, this is at least in part due to the year 2008 being an outlier. The comparisons to 2007 did not show these substantial increases.

Figure 5.

Top 2 Sexual Orientation Bias Motivations by Year, 2000 to 2009
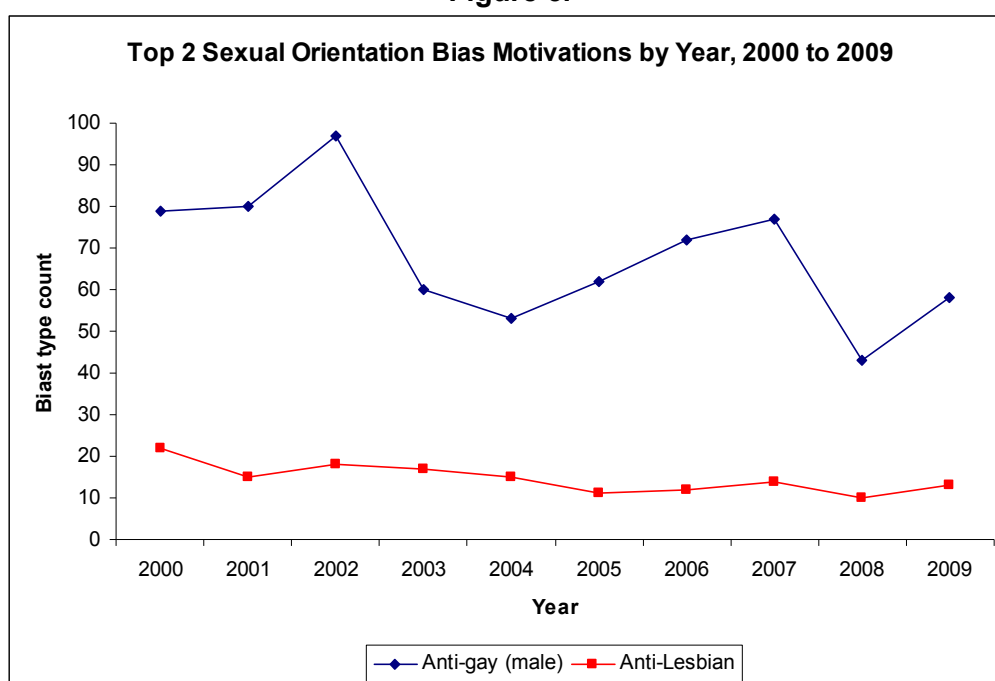
The two within-type hate crime types for sexual orientation were only moderately correlated and even that moderate correlation was not statistically significant. The analysis of outliers resulted in 2002 being unusually high for Anti-Gay bias motivated hate crimes and 2000 being unusually high for Anti-Lesbian motivated hate crimes.[21] The reasons for this were not apparent.

Specific Religious Bias Motivations

Figure 6 depicts a breakdown for the specific religious bias motivations for the ten-year time frame. The overwhelming majority of religious bias motivations were Anti-Semitic (75.3%), followed by Anti-Islamic (12.8%), and Anti-Catholic (6.6%). These three bias motivations accounted for a combined 94.7% of all religiously-based bias motivations. Anti-Protestant and

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[19] The standard deviation for Anti-Gay was about 4.4 times larger than for Anti-Lesbian (15.82 versus 3.59).
[20] One-way ANOVA resulted in statistically significant between group differences (F=144.843, Post Hoc Tukey-HSD showed significant mean differences among all groups at p=.05, Appendix D).
[21] z-scores of 1.83 and 2.03 respectively.

Anti-other religion, accounted for only 2.7% and 2.6 %, respectively. The remainder of this part of the analysis focuses on the three most common religious bias motivations.

Figure 6.
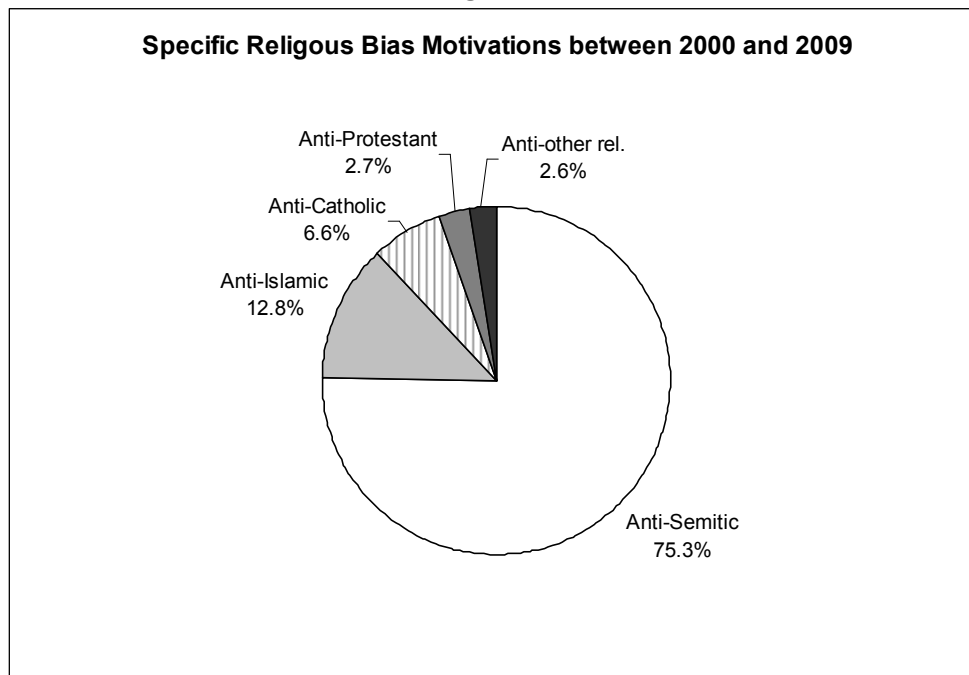
The mean number of reported Anti-Semitic hate crime offenses was about 55 per year, followed by Anti-Islamic (about 9 offenses per year), Anti-Catholic (about 5 offenses per year), and Anti-Protestant (about 2 offenses per year). Only the mean for Anti-Semitic hate crime offenses was significantly different from the other religious group means. The means for Anti-Islamic, Anti-catholic, and Anti-Protestant offenses, however, were too small to differentiate statistically with any reasonable certainty.[22] Still, variation in the number of religiously-motivated hate crimes from year-to-year did exist.[23]

The trend analysis of within-type religiously-motivated hate crime showed a decline over the ten-year period (see Figure 7). The decline for Anti-Semitic hate crimes was the most pronounced: about 3.7 times larger than the next largest decline of Anti-Islamic hate crimes. The decline in Anti-Catholic hate crimes was relatively small. Anti-Catholic hate crimes declined by not even half of the decline in Anti-Islamic offenses and about one-eighth of the decline in Anti-Semitic hate crimes.

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[22] One-way ANOVA resulted in statistically significant overall group differences (F=59.611, Post Hoc Tukey-HSD showed significant mean differences **only** for the Anti-Semitic bias group at p=.05, Appendix E).

[23] Standard deviations were 18.72, 8.26, and 3.49 respectively.

Figure 7.

**Top 3 Religion Bias Motivations by Year, 2000 to 2009**
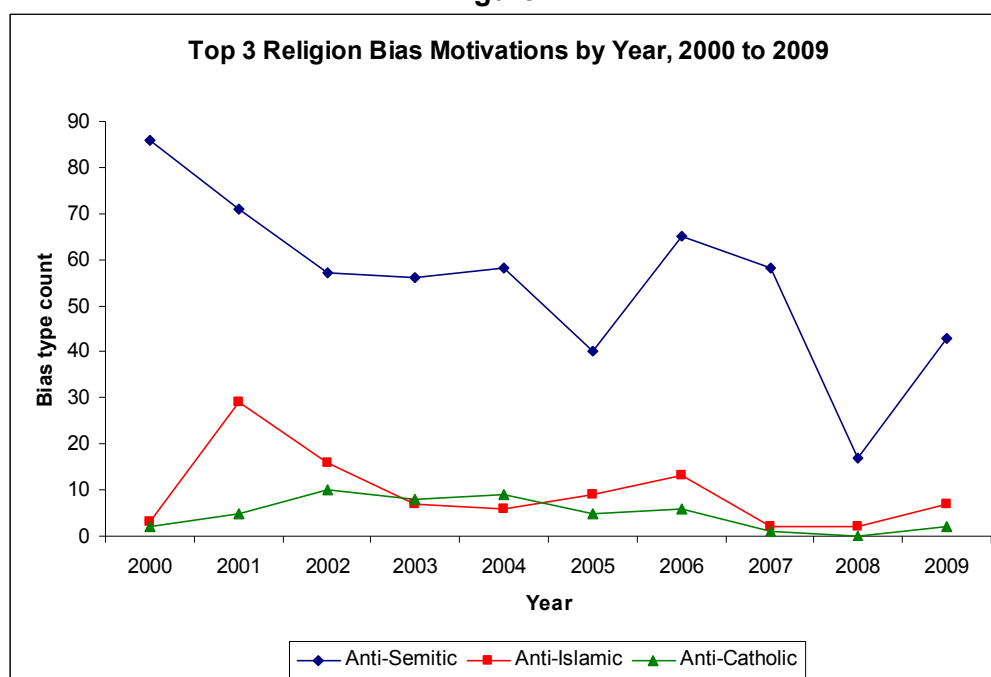
This ten-year decline was evident despite a spike in offenses between the years 2008 and 2009. Anti-Semitic hate crimes more than doubled between these two years, and Anti-Islamic hate crimes more than tripled. In the case of Anti-Semitic hate crimes. This again was partially due to 2008 being an outlier in terms of reported hate crimes.[24] In the case of Anti-Islamic crimes, the increase resulted because only two cases were reported in 2008, whereas seven offenses were reported in 2009. Fewer Anti-Islamic hate crimes were reported in 2008 and 2009 than in most prior years. On the contrary, 2001 stood out in terms of unusually high counts of Anti-Islamic hate crimes. This too, like Anti-Islamic bias based hate crimes, was most likely due to a spike of incidents reported in September and October of 2001. The only other year noteworthy in terms of being unusually high or low is the year 2000, in which Anti-Semitic crimes were unusually high. The reasons for this were again not apparent.

One specific bias type stood significantly out within each larger bias category. For racial/ethnic bias it was Anti-Black, for religious bias it was Anti-Semitic, and for sexual orientation bias it was Anti-Gay. Not surprisingly, the corresponding bias motivation types also represented the most common specific motivation types overall. Anti-Black was the most frequent within-bias hate crime (29%), Anti-gay (17%), and Anti-Semitic (14%) All three specific bias motivations exhibited relatively strong correlations over the ten reporting years.[25] Figure 8 compares these bias types over the ten-year period.

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[24] z-score equals negative 2.04.
[25] For Anti-Black and Anti-Gay (male) r=.761, for Anti-Black and Anti-Semitic r=.815, and for Anti-Semitic and Anti-Gay (male) r=.662. All correlations were statistically significant.

Figure 8.

Top 3 Specific Bias Motivations by Year, 2000 to 2009
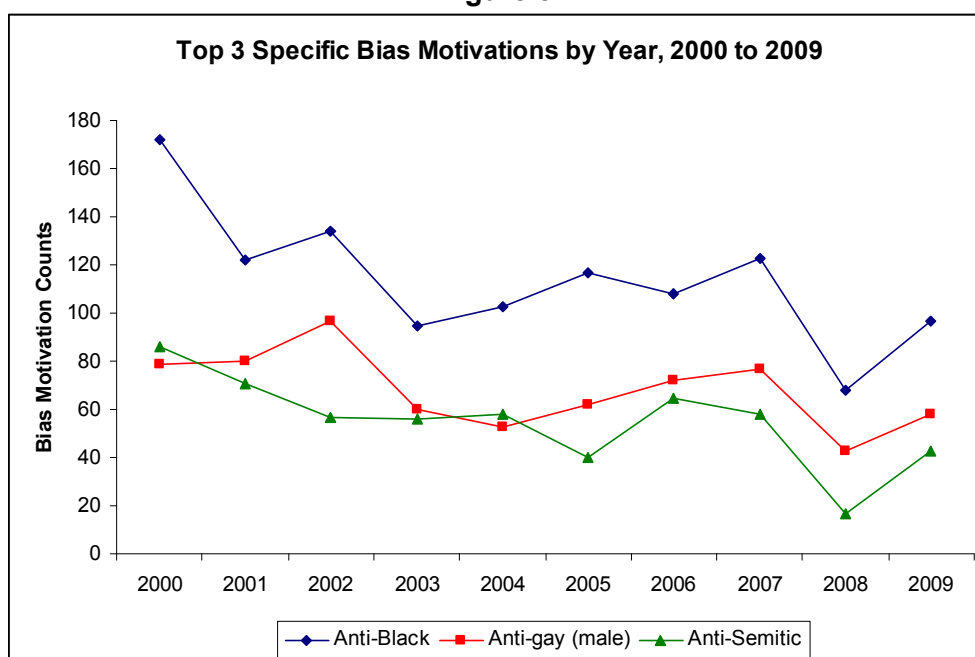
Criminal Offenses That Occurred During The Hate Crime[26]

Prior research on the type of criminal offenses committed during hate crimes found that most incidents involved violent crimes (Strom 2001) or emphasized the violent nature of hate crimes (Levin and McDevitt, 1993; Craig 2002). Results regarding the severity of the injuries to victims are, however, mixed (Messner, McHugh and Felson, 2004; Tillyer and Miller, 2009). The relationship between the type of hate bias motivation and hate bias crimes or offenses remains relatively unknown (Messner, McHugh, and Felson, 2004). This part of the report will attempt to shed some light on the type of reported hate crimes committed in Massachusetts between 2000 and 2009, the extent to which they are violent, and the nature of their relationship to the underlying bias motivation.
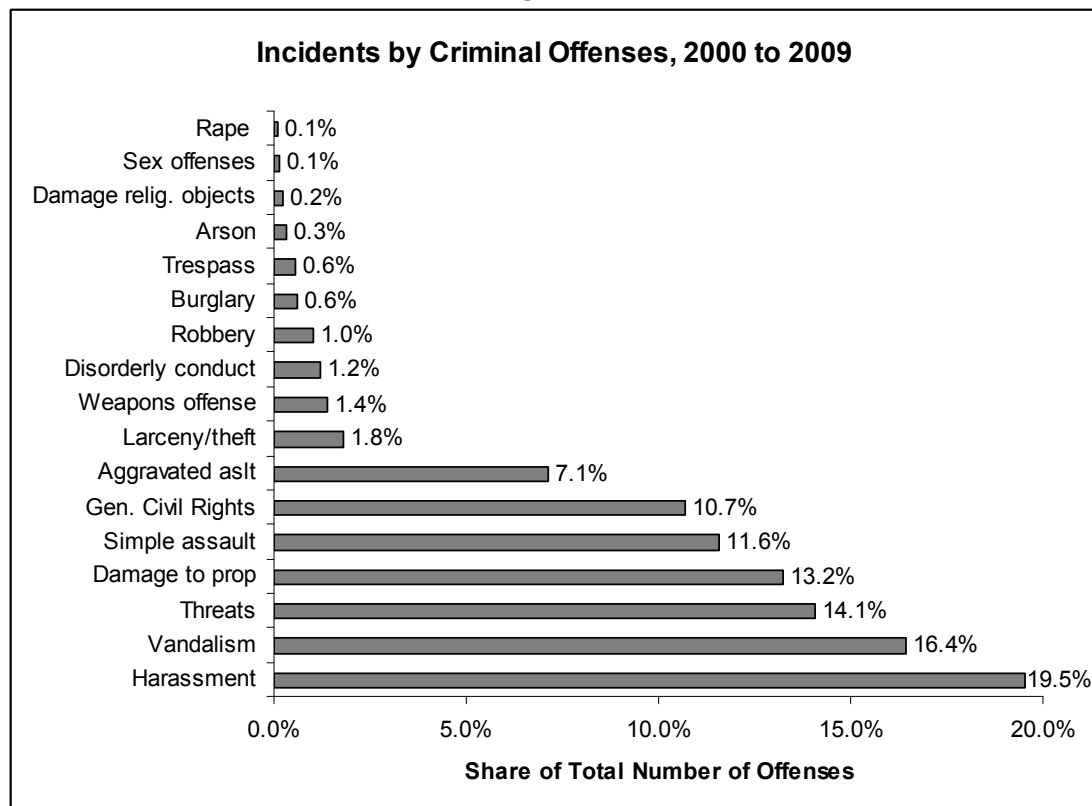
As previously outlined, multiple offenses or crimes can be recorded per hate crime incident. The analysis of the data set showed that 54.1% of all reported hate crime related incidents involved one offense or crime, 27.5% involved 2 offenses or crimes, and 16.9% involved 3 offenses or crimes.[27] Figure 9 depicts a breakdown of the total reported criminal offenses that occurred during all reported hate crime incidents from 2000 to 2009. The seven most common types of offenses occurring during those incidents are harassment (19.5%), vandalism (16.4%), threats (14.1%), damage to property (13.2%), simple assault (11.6%), general civil rights violations (10.7%), and aggravated assaults (7.1%). All remaining crime categories account for less than 2% each. These seven criminal offense types account for 92.6% of all reported offenses that occurred during hate crimes between 2000 and 2009. There was one murder

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[26] Hate crimes as defined by Massachusetts Hate Crime Reporting Form crime code categories and reported to the CRU.
[27] The remaining 1.5% of incidents had missing data on the number of offenses or crimes.

reported as an offense that occurred during a hate crime incident which is not shown in Figure 9.[28]

Figure 9.

Incidents by Criminal Offenses, 2000 to 2009

Offense	Share
Rape	0.1%
Sex offenses	0.1%
Damage relig. objects	0.2%
Arson	0.3%
Trespass	0.6%
Burglary	0.6%
Robbery	1.0%
Disorderly conduct	1.2%
Weapons offense	1.4%
Larceny/theft	1.8%
Aggravated aslt	7.1%
Gen. Civil Rights	10.7%
Simple assault	11.6%
Damage to prop	13.2%
Threats	14.1%
Vandalism	16.4%
Harassment	19.5%

Share of Total Number of Offenses

There are seven main offense classifications that are used to measure the prevalence of crime in the nation. This report focuses only on violent versus non-violent crimes.   Violent crime, for the purposes of this report is defined as including murder, non-negligent manslaughter, forcible rape, robbery, and aggravated assault. This definition is more restrictive than the one utilized by Strom (2001), the primary difference being his inclusion of intimidation and simple assault. Using the above definition of violent crime 8.23%[29] of all reported criminal offenses were violent and 12.8% of all reported hate crime incidents involved violent offenses.[30]

Continuing the analysis on the incident level, where more than one offense or bias motivation[31] is possible per incident, it was found that 14.7% of all Anti-Race/Ethnicity incidents, 15.4% of all Anti-Sexual Orientation incidents, 17% of all Anti-Handicap incidents, and 2.6% of all Anti-

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[28] It would have accounted for 0.017% of all criminal offenses occurring during a hate crime. Additionally, there were no reported incidents of manslaughter between 2000 and 2009.

[29] This increases to 52.3% if Strom's definition from 2001 is applied for the three largest violent categories aggravated assault, simple assault, or intimidation. That is generally consistent with the 57% he found for these three categories.

[30] Multiple offenses per incident are possible. For incidents with multiple offenses the incident is counted as violent if at least one of the offenses was violent.

[31] For incidents with multiple bias motivations the incident is counted towards the respective bias motivation if at least one of the bias motivations matched the respective category.

Religion incidents involved at least one violent offense.[32] A closer investigation of the relationship between bias motivation and whether the incident involved violent crimes was conducted via a basic binary logistic regression model.[33]

The logistical regression analysis examined the likelihood that a reported hate crime incident included at least one violent offense broken down by each bias category. Anti-religion bias motivations were chosen as the reference category because they were the least frequent incidents with violent offenses. This is consistent with prior research showing most Anti-religion hate crimes involved some form of property crime, in particular property damage (Strom, 2001).

Logistic analysis showed that the presence of either racial/ethnic, sexual orientation, or handicap bias significantly increased the probability of a violent offense occurring during a hate crime incident, when compared to Anti-Religion hate crimes. A violent offense was 2.64 times more likely to occur during a reported hate crime when Anti-Race/Ethnicity bias was present during the incident. The incident was 2.62 times more likely to have a violent offense when Anti-Sexual Orientation bias was present during the incident and 2.33 times more likely when Anti-Handicap bias was present.[34] Again all likelihood comparisons are in relation to Anti-Religion bias motivations.

Hate crime incidents can also be classified by whether a weapon was used or by the type of location of the incident. Figure 10 illustrates that the majority of hate crime incidents did not involve a weapon (54%). Most offenses (24%) involved unspecified weapons, followed by the use of hands, feet, or fists (16%). The use of knives (4%), rocks or bricks (3%), sticks or clubs (3%), and guns (1%) was relatively infrequent. It is of course possible that multiple weapons per incident were reported.

Figure 10.

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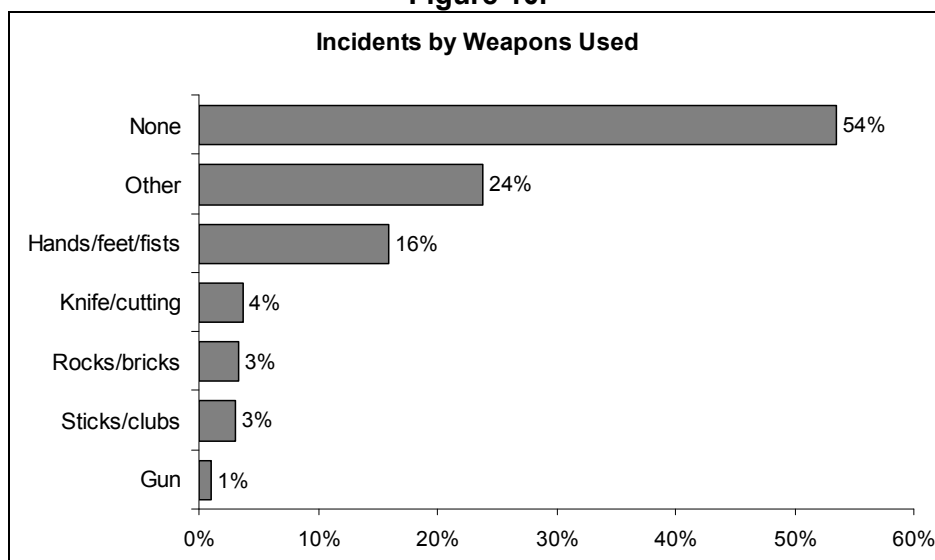
[32] There were no reported Anti-Gender bias based incidents involving violent crimes. It is not apparent why Anti-Handicap was the highest category.

[33] A logistic regression model which allows analysis of qualitative measures of effectiveness. For example in cases where the dependent variable and independent variables have two categories measuring that a given attribute of interest is either present or absent.

[34] See Appendix F for more detailed results.

Most reported hate crime offenses were committed in open spaces[35] (30.9%), followed by residences (28.4%), commercial/retail locations (17.8%), and schools/colleges (14.6%). These four location categories account for 91.7% of all hate crime locations. Figure 11 provides a complete breakdown of all location categories. The mean number of offenses was about 104 for open spaces, about 97 for residences, about 61 for commercial/retail locations, and about 50 for schools/colleges per year.

Figure 11.

Hate Crime Offenses by Location, between 2000 and 2009
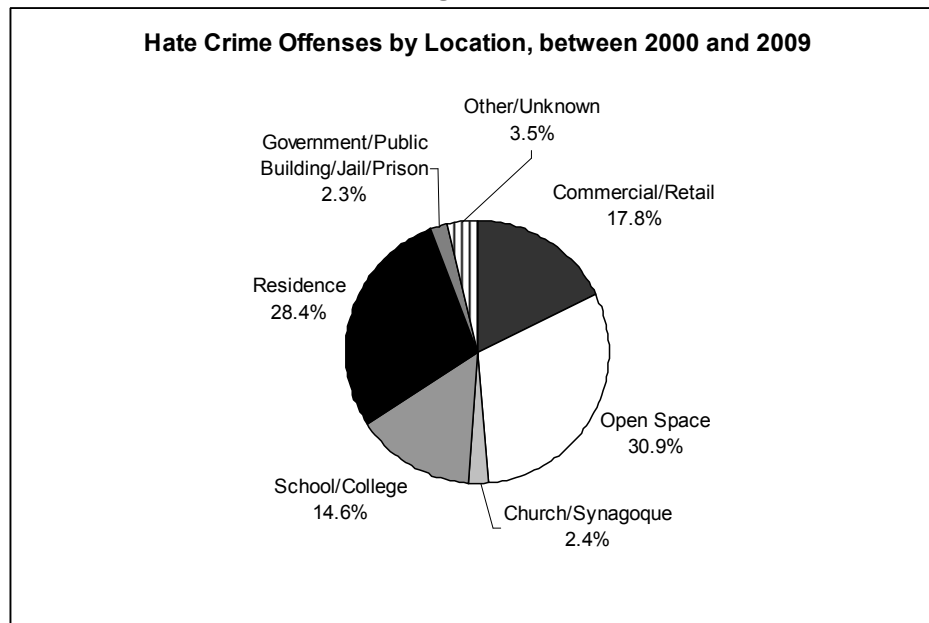
Hate Crime Victims and Offenders

The analyses presented below are based on victim, witness, or law enforcement's perceptions of offender's age, gender, and race/ethnicity. These perceptions on offender characteristics are for reported hate crimes committed in Massachusetts between 2000 and 2009.

Hate crime incidents can be categorized by victim type, for example if the principle target was a person, private property, public property, religious facility, or other.[36] Multiple victim types or targets per incident can be reported and 78.9% of all incidents indicated two victim types. Only 20.8% of all incidents reported only one victim type.[37]
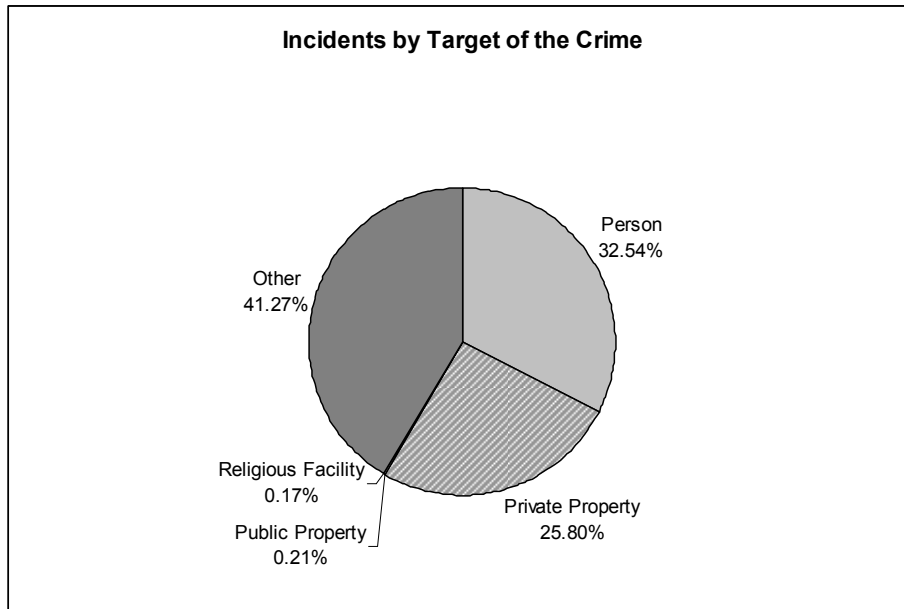
The vast majority of hate crimes were committed against other targets (41.2%, no clarifications were available), followed by crimes against persons (32.5%), and private properties (25.8%). The smallest percentages of hate crimes were committed targeting religious facilities and public properties (about 0.2% respectively). Figure 12 depicts a complete breakdown by victim/target type.

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[35] Construction sites, fields/woods/parks, highways/roads/alleys, lakes/waterways, or parking lots/garages (Strom, 2001). Consistent with findings by Perry (2001).
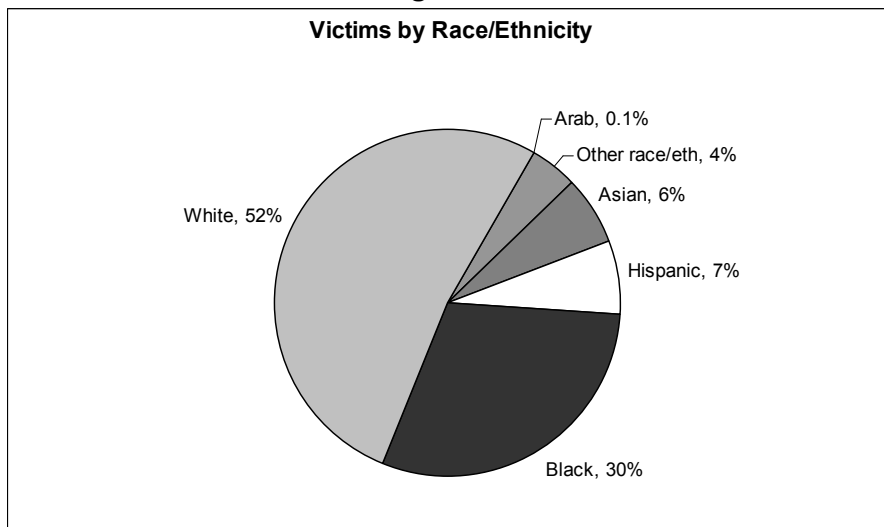[36] Massachusetts Hate Crime Reporting Form, CRU-2, rev 11/94.
[37] The remaining .3% of incidents did not report any victim type.

Figure 12.[38]

Incidents by Target of the Crime

Person
32.54%

Other
41.27%

Religious Facility
0.17%

Public Property
0.21%

Private Property
25.80%

Multiple victims are also possible if the reported hate crime incidents targeted persons. Of these, however, the vast majority had only one victim (81.3%), followed by two victims (13.9%) and three victims (4.8%).[39]   The majority of all reported hate crime victims were male (approximately 63%) versus 37% of hate crimes victims being female. The percentage of female victims increased slightly for incidents with multiple victims to 42.5 % for the second victim and 41.7% for the third victim.   Figure 13 shows the racial breakdown of all hate crime victims. The largest percentage of victims were white (52%), followed by black (30%), Hispanic (7%) and Asian (6%). The smallest percentage of victims were other and Arab (4% and <1%, respectively).

Figure 13.

Victims by Race/Ethnicity

Arab, 0.1%

Other race/eth, 4%

Asian, 6%

Hispanic, 7%

White, 52%

Black, 30%

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[38] Percentages reflect the total number of targets and include incidents with multiple targets.

[39] Counted by victim ages, counts by race or gender yielded slightly different results due to missing data issues.

The age of victims ranged from 1 to 90, with the average age of the first victim being about 33 years old. For incidents with multiple victims the average age of the second victim was about 28, and the age of the third victim was about 24 years old.

Figure 14 shows the percentage breakdown of victims by age group. Most victims of reported hate crimes between 2000 and 2009 were ages 16 to 25 (30%), with victims ages 16 to 20 and 21 to 25 each accounting for 15%. Twenty-one percent of victims were ages 36 to 45, and 20% were ages 26 to 35. Victim ages 10 and younger were relatively infrequent (2%).
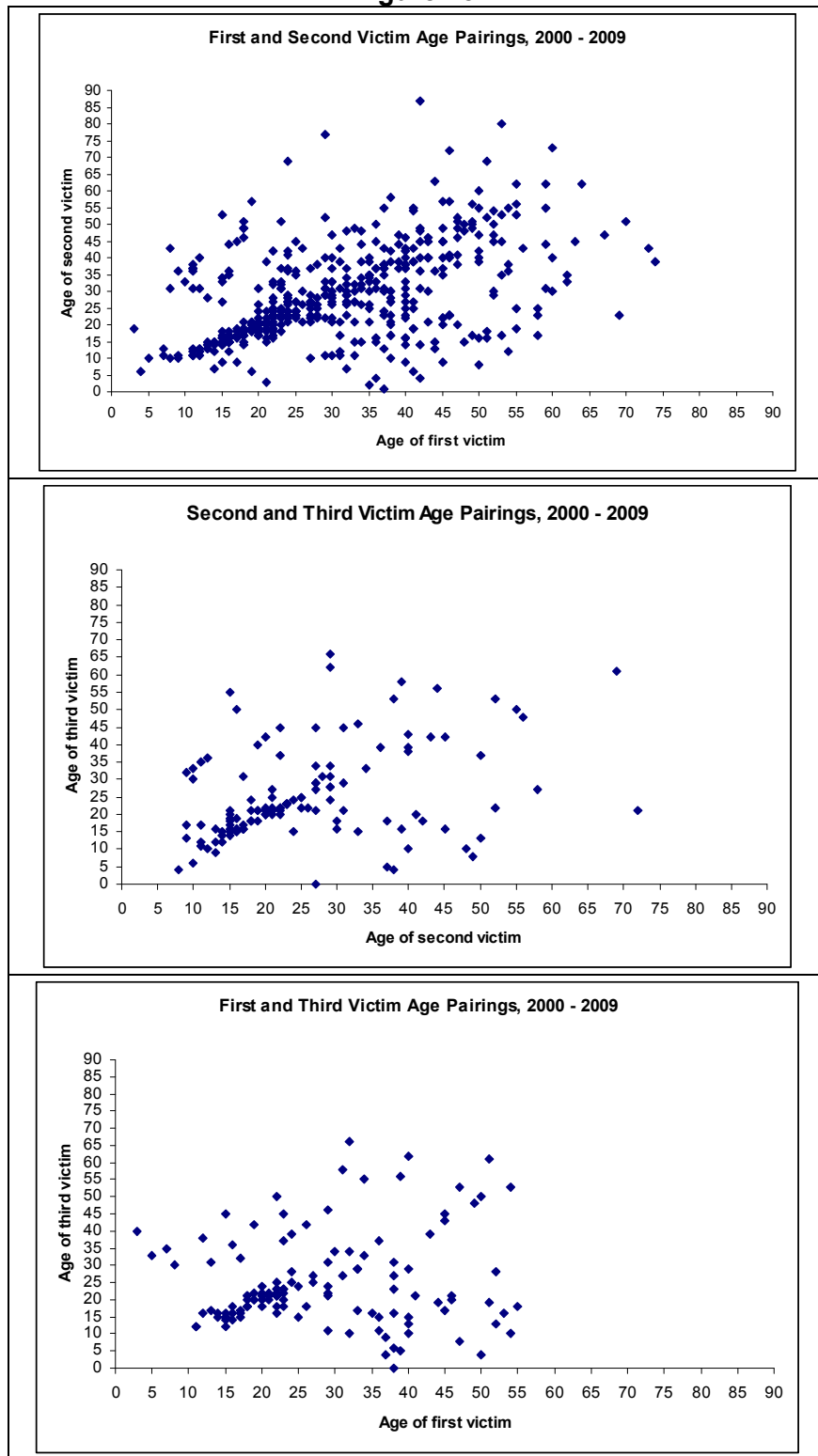
Figure 14.
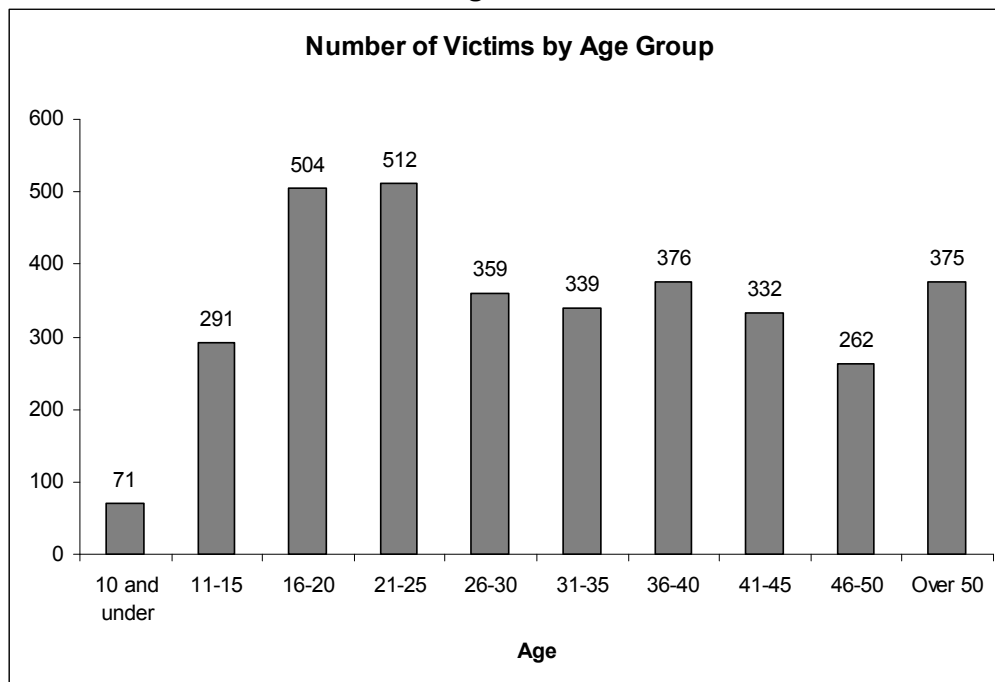
The overall ages of the victims, in incidents with multiple victims, were only moderately positively correlated with the age of the first victim and second victim exhibiting a correlation on the higher end of the moderate range, followed by the correlation between the ages of the second victim and the third victim.[40] There was no overall correlation between the age of the first victim and the age of third victim.

A closer look at the victim age combinations via scatter plots, however, did indicate some clusters and patterns for the younger age pairings. More dense clusters or patterns appeared for the younger age combinations, especially for victim ages younger than 30. Figure 16 depicts these clusters for all possible pairings of victim ages. An analysis limited to victims younger than 30 did show relatively strong positive correlations[41] for that age range, as perhaps one would have expected. For incidents with multiple victims younger than 30, the victim ages were therefore strongly positively correlated. For incidents with multiple victims older than 30 they were only moderately positively correlated, if at all. Clusters and patterns did appear to exist within the dataset, perhaps suitable to advanced clustering, segmenting, or association analysis such as data mining, in particular via decision trees.

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[40] r = .492 and .364 respectively. Correlations are significant at the 0.01 level (2-tailed).
[41] r = .730, .696, and .619 respectively. Correlations are significant at 0.01 level (2-tailed).

Figure 15.

First and Second Victim Age Pairings, 2000 - 2009

Second and Third Victim Age Pairings, 2000 - 2009

First and Third Victim Age Pairings, 2000 - 2009

The appearance of clusters and patterns was also clearly visible in the first data cube scatter plot showing all three victim age dimensions at once, as seen in Appendix G.

The overall ages of the victims and the ages of the offenders were either not correlated at all,[42] only weakly positively correlated for the second victim, or only moderately positively correlated[43] for the first victim. Figure 16 below graphically depicts the age pairing of victim and offender ages. The victims are by row, the offenders are by column. For example, the first victim and the first offender pairing are in the top left cell, the third victim and the second offender are in the center bottom cell. Offender ages are on the horizontal axis, victim ages on the vertical axis. The side by side comparisons, although perhaps difficult to read in detail, clearly showed clusters forming for victim and offender ages below 30, across all possible victim and offender combinations.

Figure 16.
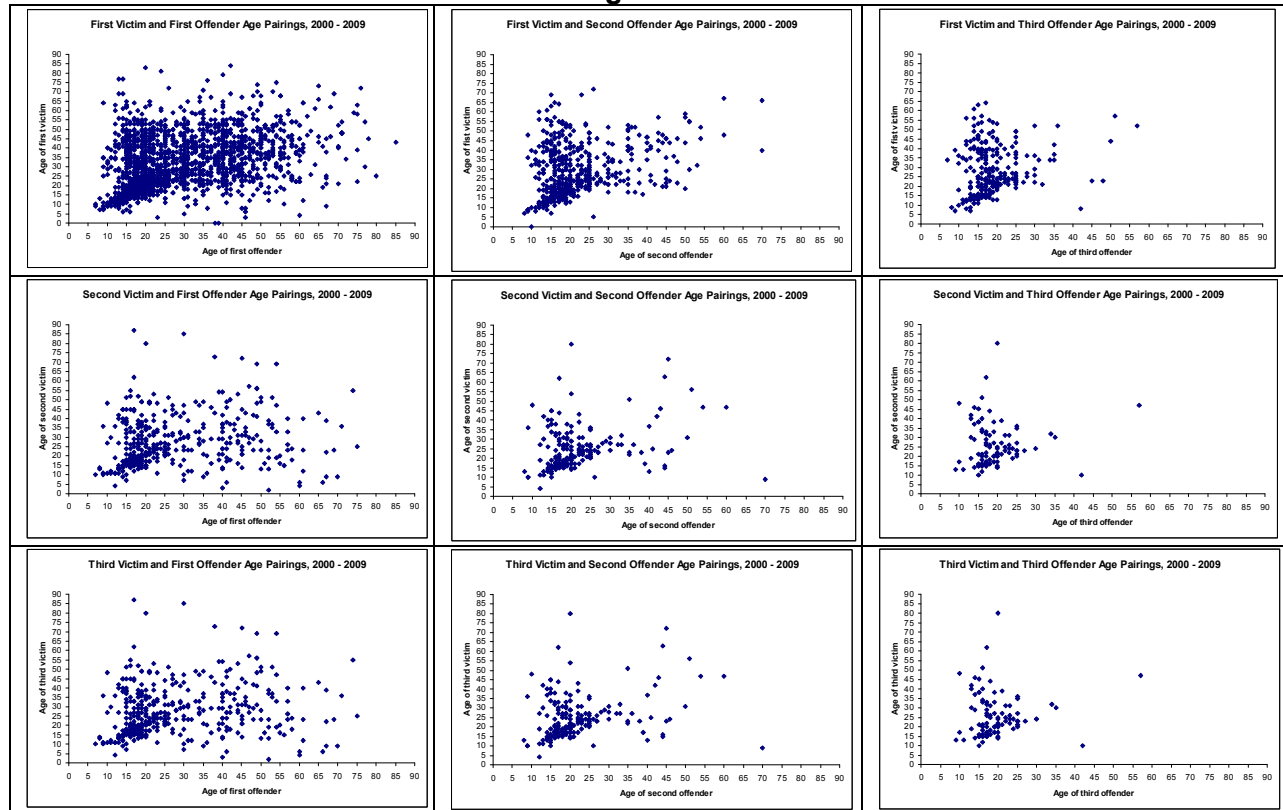
A correlation analysis for victim and offender ages below 30 yielded similar results and increased correlations for the victim ages under 30 to each other. For example the correlation between the ages of the first victim and the first offender increased from a moderate positive correlation to a relatively strong positive correlation,[44] whereas other correlations became moderate and significant where none could be detected before.

The age of hate crime offenders, for all offenders, ranged from 7 to 95. Figure 17 illustrates the percentage breakdown of offenders by age group. Most offenders who committed hate crimes between 2000 and 2009 were ages 16 to 20 (30%), followed by offenders ages 11 to 16 (17%) and ages 21 to 25 (15%). Offenders ages 50 and older were relatively infrequent (7%).

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[42] Second victim and third offender as well as third victim to any offender. None of the correlations are statistically significant.

[43] r is between .149 (second victim and first offender) and .380 (first victim and first offender).

[44] r = .601, correlation statistically significant at the .01 level (2-tailed). Up from .380.

Figure 17.

Number of Offenders by Age Group
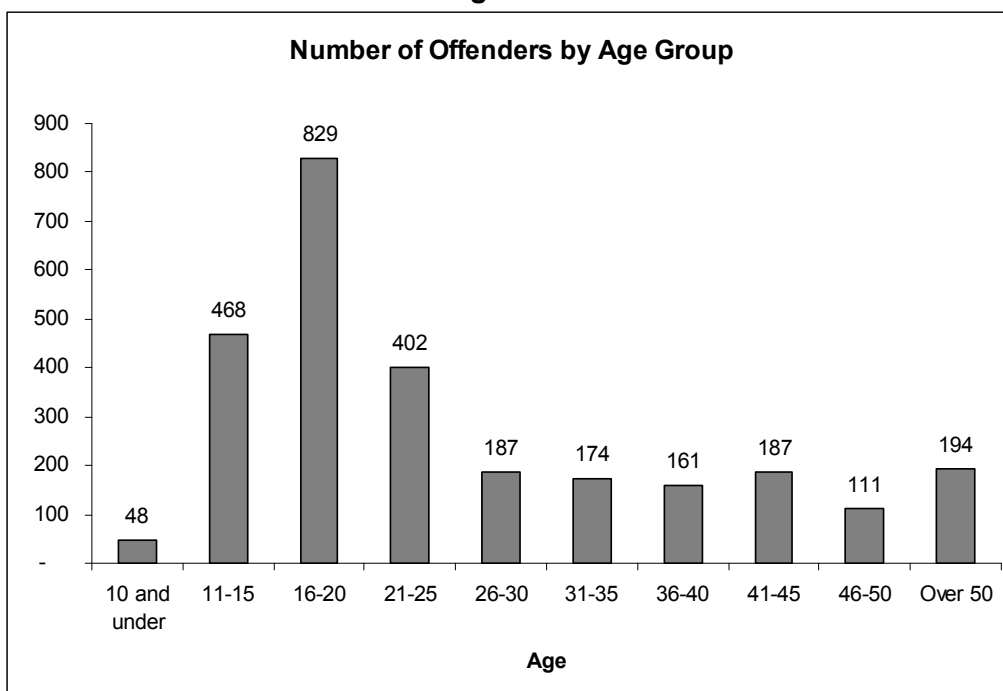
The overall ages of the offenders, in incidents with multiple offenders, were strongly positively correlated.[45] A closer look at the possible offender age combinations via scatter plots, did again indicate clusters and patterns for the younger age pairings, especially for offender ages younger than 30.   Figure 18 depicts these clusters for all possible pairings of offender ages.

The second figure in Appendix G illustrates a three dimensional data cube scatter plot for all three offender age combinations at once. Age clusters and patterns for offender ages were again clearly visible in this data cube.

These patterns and clusters prompted a correlation analysis limited to offenders under the age of 30. The results of this analysis exhibited even stronger correlations,[46] leading to the conclusion that the ages of the offenders, in incidents with multiple offenders under the age of 30, are very strongly positively correlated compared to all offender age combinations.

The data set clearly lends itself to data mining, in particular detecting and exploring associations and clusters, using techniques such as decision trees. Decision trees are relatively robust and easy to learn to read and understand. This is why some very basic examples are included the upcoming part of this report. Readers need to be cautioned, though, that these particular decision trees are only explorative in terms of detecting associations among variables of interest. They are neither validated nor do they represent any complex or multi-level relationships and can therefore not be utilized for predictive analysis of any kind.

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[45] r = .766 for first offender and second offender, .786 for second offender and third offender, and .720 for first offender and third offender. All correlations are significant at the .01 level (2-tailed).

[46] r = .888 for first offender and second offender, .906 for second and third offender, and .863 for first offender and third offender. All correlations are again significant at the .01 level (2-tailed).

Figure 18.
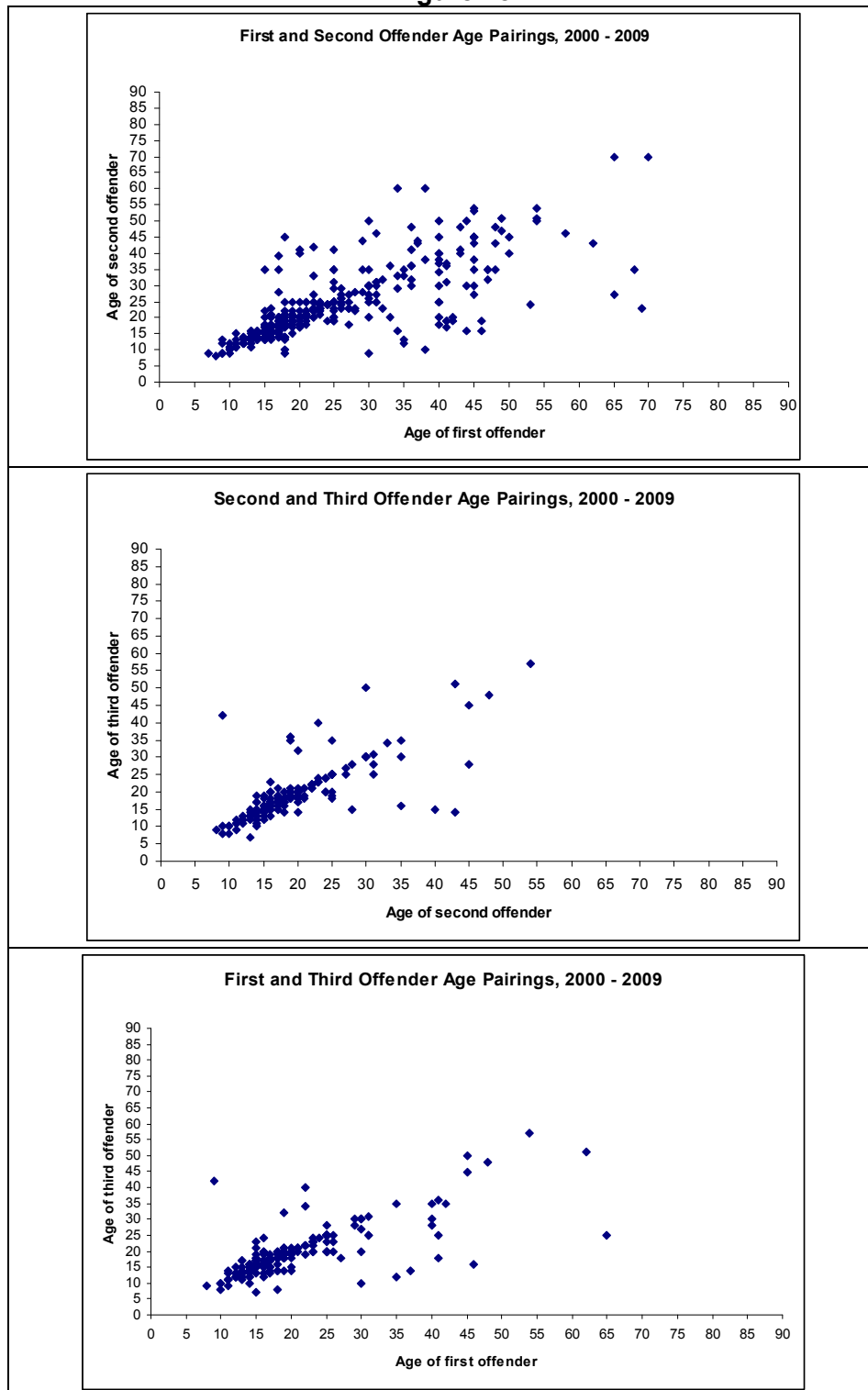
The appearance of clusters and patterns was also clearly visible in the second data cube scatter plot showing all three offender age dimensions at once, as seen in Appendix G.

As discussed earlier in this report, hate crime data, despite its many limitations, can still be informative when analyzing trends and patterns, in particular the relationship between variables. Logistic regression highlighted some very basic relationships between bias motivation categories and whether a hate crime incident included a violent offense or crime. The age-based analysis led to the identification of clusters or patterns within the ages of offenders and victims. Decision trees were utilized to better understand the relationship between the ages of offenders, their victims, and such issues as whether a violent offense or crime occured during a hate crime incident, whether weapon usage was reported, or whether a victim was injured.

Figure 19 depicts the relationship of offender ages as they related to whether a violent offense occurred (coded as "Yes") or whether it did not occur (coded as "No").[47] The age of the offender is based on the age of the first offender, for incidents with a single offender, or the average age of all offenders, for cases with multiple offenders. Data on the specific criminal offenses which occurred during the incident and offender ages was available for 1,898 incidents. Of those, 379 incidents, or 20%, contained at least one violent crime. Decision tree analysis was utilized to identify statistically significant clusters of offender ages by which the overall data could be partitioned. Each node in Figure 19 therefore depicts a statistically distinct age cluster or group.
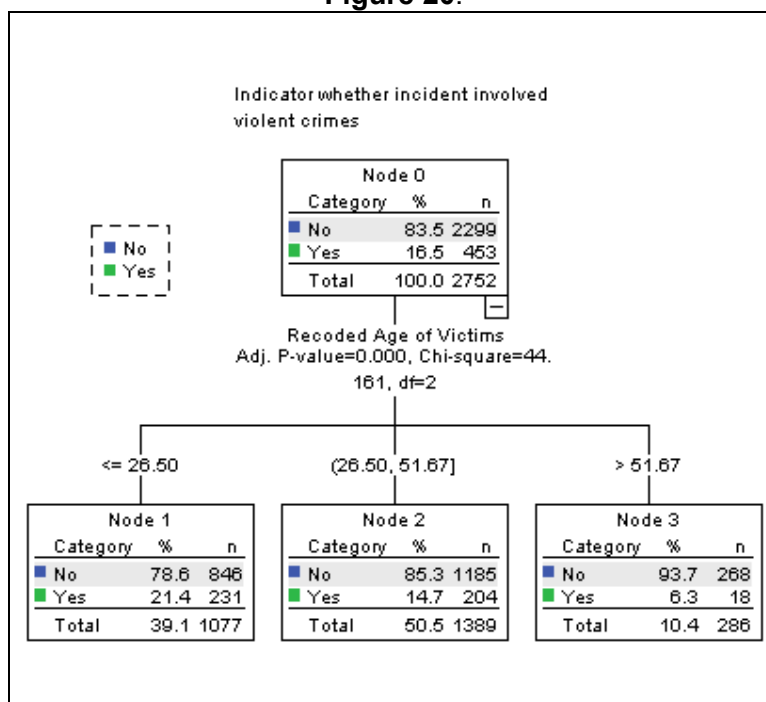
Figure 19.
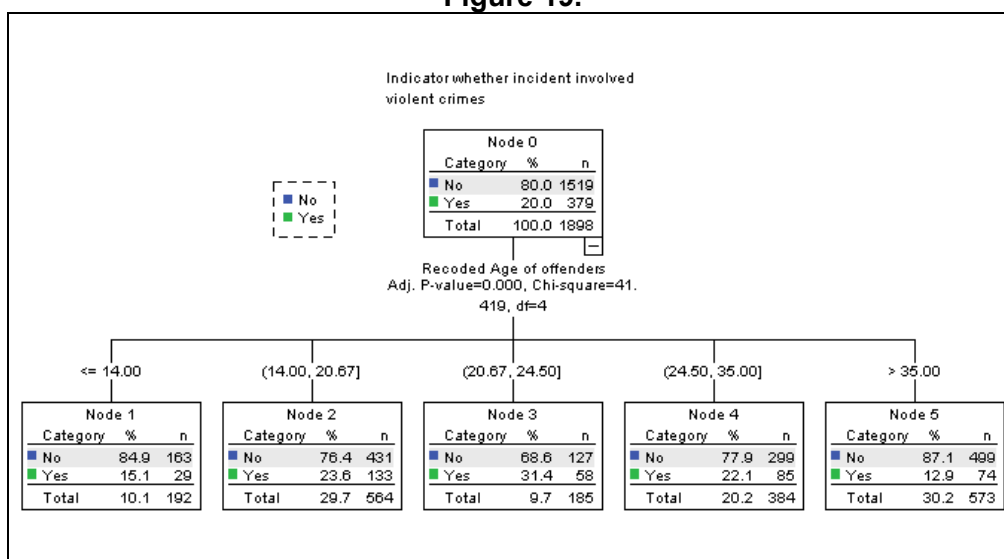
The overall share of violent crimes across all offender ages was 20%. That share decreased to 15.1% for offenders younger than 14 and to 12.9% for offenders older than 35 years. The share increased, however, for offenders between the ages of 14 and 35 years, with the most pronounced increase to 31.4% for offenders between just older than 20 and just younger than 25.

Figure 20 illustrates victim ages as they related to whether a violent offense occurred, also coded as "Yes" when it did or "No" when it did not happen. Here too, the age of the victim is based on the age of the first victim, for incidents with a single victim, or the average age of all victims, for cases with multiple victims. Data on victim ages and the specific criminal offenses

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[47] Same definition of violent crime as earlier outlined in this report. For incidents with multiple violent offenses the variable again was coded as yes if at least one of the offenses was violent.

23

which occurred during the incident was available for 2,752 incidents. Of those, 453 incidents, or 16.5%, contained at least one violent crime.

Figure 20.

Compared to the previous decision tree on offender ages, shown in Figure 19, it does depict fewer statistically distinct groups (three age-based groups compared to five for offender ages). The overall share of violent crimes across all age groups was 16.5%. That share increased to 21.4% for victims younger than just approximately 26 years. The share somewhat decreased to 14.7% for victims between the ages of about 26 and about 51 years. It did decrease substantially to 6.3% for victims aged 51 years or above.

Figure 21 shows the relationship of offender ages and whether a weapon was used during the incident, coded as "Yes" when at least one weapon was used or "No" when no weapons were used. The age of the offenders was again based on the age of the first offender, for incidents with a single offender, or the average age of all offenders, for cases with multiple offenders. Data on the whether at least one weapon was used during the incident and offender ages was available for 1,916 incidents. Of those, 1,030 incidents, or 53.8%, contained incidents in which at least one weapon was used.[48]

Across all age groups, the overall share of incidents in which at least one weapon was used was 53.8%. The decision tree methodology determined only two age groups for which the data could be statistically partitioned, offenders below and above 35 years of age. For offenders younger than 35, the share of incidents in which at least one weapon was used increased to 59.4%. For offenders older than 35, the share decreased to 40.6%.

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[48] Discrepancies with Figure 10 are due to Figure 10 being based on all 3,648 reported incidents whereas Figure 21 is only based on incidents for which data on both weapons and offender ages was available, yielding a smaller dataset of above mentioned 1,916 incidents.

Figure 21.

Indicator whether a weapon was involved in incident

Node 0
Category	%	n
■ No	46.2	886
■ Yes	53.8	1030
Total	100.0	1916

Recoded Age of offenders
Adj. P-value=0.000, Chi-square=57.899, df=1

<= 35.00

Node 1
Category	%	n
■ No	40.6	543
■ Yes	59.4	796
Total	69.9	1339

> 35.00

Node 2
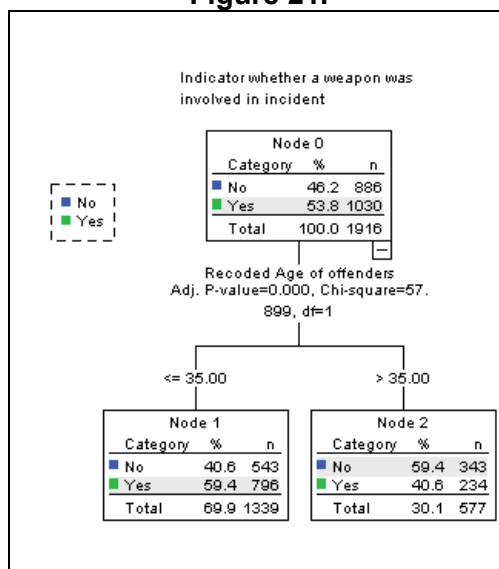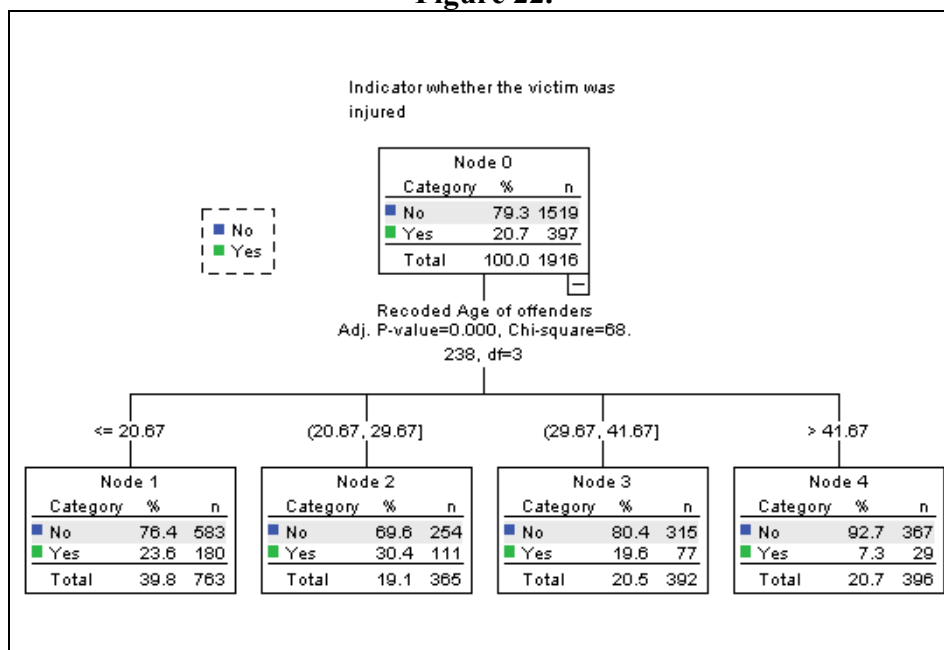| Category	%	n
■ No	59.4	343
■ Yes	40.6	234
Total	30.1	577

Figure 22 highlights the relationship between the ages of offenders and whether at least one victim was injured during the hate crime incident, coded as "Yes" when at least one victim was injured or "No" when no victims were injured. The age of the offenders was again based on the age of the first offender, for incidents with a single offender, or the average age of all offenders, for cases with multiple offenders. Data on offender ages and whether at least one victim was injured during the incident was available for 1,916 incidents. Of those, 397 incidents, or 20.7%, contained incidents in which at least one victim was injured.

Figure 22.

Indicator whether the victim was injured

Node 0
Category	%	n
■ No	79.3	1519
■ Yes	20.7	397
Total	100.0	1916

Recoded Age of offenders
Adj. P-value=0.000, Chi-square=68.238, df=3

<= 20.67

Node 1
Category	%	n
■ No	76.4	583
■ Yes	23.6	180
Total	39.8	763

(20.67, 29.67]

Node 2
Category	%	n
■ No	69.6	254
■ Yes	30.4	111
Total	19.1	365

(29.67, 41.67]

Node 3
Category	%	n
■ No	80.4	315
■ Yes	19.6	77
Total	20.5	392

> 41.67

Node 4
Category	%	n
■ No	92.7	367
■ Yes	7.3	29
Total	20.7	396

The decision tree in Figure 22 partitions the offender ages into four groups for which statistically significant associations can be detected. The overall share of victim's injuries across all offender ages was 20.7%. That share slightly decreased to 19.6% when the offenders are between the ages of roughly 30 and 41 years. It decreased more markedly to 7.3% for offenders older than approximately 41 years. It increased somewhat for younger offenders aged 20 or younger to 23.6% and more prominently to 30.4% for offenders between the ages of roughly 20 and 30 years.

Further demographic statistics on offenders showed the vast majority of hate crime offenders were male (81%). Approximately 19% of offenders who committed hate crimes were female. Figure 23 shows the racial breakdown of individual hate crime offenders. The largest percentage of offenders were white (67%), followed by black (25%), and Hispanic (6%). The smallest percentage of offenders were Asian or Other race/ethnicity (1% and <1%, respectively).

Figure 23.

Percentage of Hate Crime Offenders by Race

Other race/eth., 1%
Hispanic, 6%
Asian, 1%
Black, 25%
White, 67%
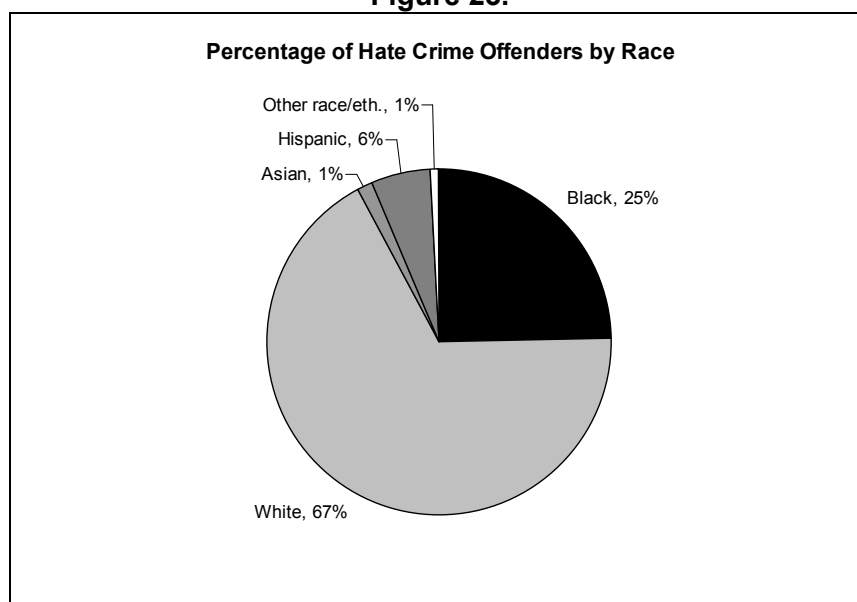
Conclusion

This report attempted to provide a better understanding of the prevalence and characteristics of hate crimes in the Commonwealth of Massachusetts, in particular for the ten-year time period between the years 2000 and 2009. The analysis was only able to highlight a few major themes and further research is necessary to 1) more fully analyze and assess the patterns and trends summarized in this report and 2) extend this kind of research to aspects and attributes of hate crimes not fully (or not at all) depicted in this report.   Future research should focus on both goals as well as utilize more advanced and complete quantitative and statistical techniques to contribute to improving the knowledge base about hate crimes. This should include techniques such as more advanced spatial analysis, more complex multi-level decision trees, as well as more advanced logistical and perhaps multi-nominal regression analysis.

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Hate Crime Incidents by County, 2000 to 2009

Hate Crime Count Quartiles 2000 - 2009
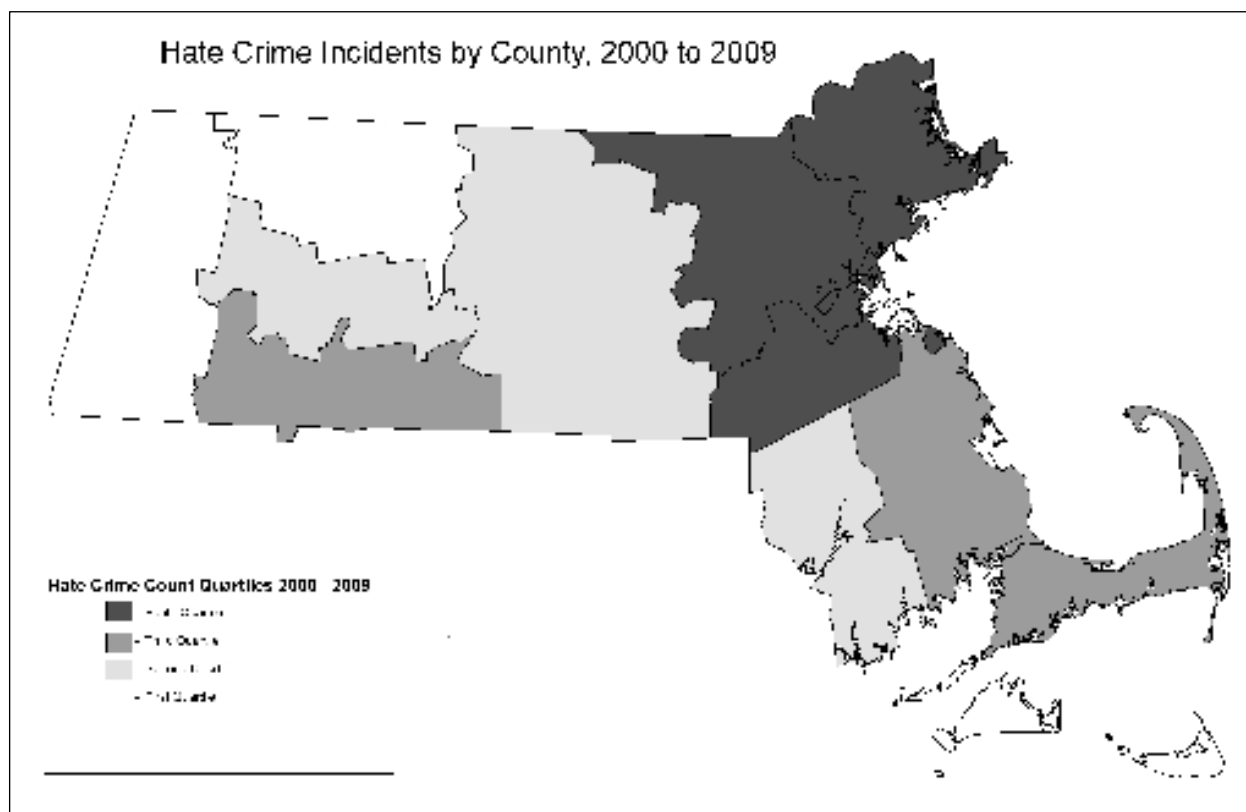
Above map indicates the distribution of reported hate crimes incident counts by county. The 14 Massachusetts counties were grouped into four quartiles. The first quartile cutoff point was counties with fewer than 61.25 reported incidents during the ten year timeframe. These counties were Dukes, Nantucket, Franklin, and Berkshire (order by fewest to highest). The second quartile cutoff point, also known as the median, was for counties with fewer than 124 incidents. These counties were Hampshire, Worcester, and Bristol. The third quartile cutoff point is counties with fewer than 195.75 incidents. These counties were Barnstable, Plymouth, and Hampden. The remaining counties with more than 195.75 incidents were grouped in the fourth quartile. These counties were Norfolk, Essex, Middlesex, and Suffolk.

Appendix B
One-way ANOVA Bias Motivation Categories

ANOVA

Number of reported offenses per year

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	340601.320	4	85150.330	89.306	.000
Within Groups	42906.200	45	953.471		
Total	383507.520	49			

Tukey HSD					
(I) Hate Crime Bias Category	(J) Hate Crime Bias Category	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Race/Ethnicity	Religion	155.800*	.000	116.56	195.04
	Sexual Orientation	144.400*	.000	105.16	183.64
	Handicap	224.300*	.000	185.06	263.54
	Gender	227.300*	.000	188.06	266.54
Religion	Sexual Orientation	-11.400	.921	-47.13	21.73
	Handicap	68.500*	.000	24.37	93.23
	Gender	71.500*	.000	27.77	96.63
Sexual Orientation	Handicap	79.900*	.000	37.07	105.93
	Gender	82.900*	.000	40.47	109.33
Handicap	Gender	3.000	.999	-31.03	37.83

*. The mean difference is significant at the 0.05 level.

All but two hate crime bias categories exhibited significant group differences in terms of the mean of reported incidents over the ten year period. The exceptions were religion and sexual bias orientation as well as handicap and gender bias motivation. The mean for religion based motivations was 73.2 and the mean for sexual bias motivations was about 84.6. Even though the means appeared to be quite different, based on sample size and variation in the data set they were not different in terms of statistical significance. It is not possible to state that Anti-Sexual bias motivations generally exceed Anti-Religion bias motivations. It is possible that the two means fall in the typical range of variation for those two bias motivations which implies one just happened to exceed the other for the given ten year timeframe. The same was true for the mean of handicap based motivations (4.7) and the mean of gender based motivations (1.7). Anti-Religion bias motivations did however generally exceed Anti-Handicap and Anti-Gender based motivations. The same was true for Anti-Sexual Orientation bias motivations.

Appendix C
One-way ANOVA Specific Racial Bias Motivation Types

ANOVA

Number of reported offenses per year

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	75149.933	5	15029.987	56.636	.000
Within Groups	14330.400	54	265.378		
Total	89480.333	59			

Tukey HSD					
				95% Confidence Interval	
(I) BiasCat	(J) BiasCat	Mean Difference (I-J)	Sig.	Lower Bound	Upper Bound
Anti-Black	Anti-White	72.500*	.000	50.98	94.02
	Anti-Asian	93.600*	.000	72.08	115.12
	Anti-Hispanic	85.300*	.000	63.78	106.82
	Anti-Arab	97.600*	.000	76.08	119.12
	Anti-other	105.400*	.000	83.88	126.92
Anti-White	Anti-Asian	21.100	.058	-.42	42.62
	Anti-Hispanic	12.800	.501	-8.72	34.32
	Anti-Arab	25.100*	.013	3.58	46.62
	Anti-other	32.900*	.000	11.38	54.42
Anti-Asian	Anti-Hispanic	-8.300	.863	-29.82	13.22
	Anti-Arab	4.000	.994	-17.52	25.52
	Anti-other	11.800	.589	-9.72	33.32
Anti-Hispanic	Anti-Arab	12.300	.545	-9.22	33.82
	Anti-other	20.100	.080	-1.42	41.62
Anti-Arab	Anti-other	7.800	.891	-13.72	29.32

*. The mean difference is significant at the 0.05 level.

Only seven out of the fifteen group comparisons revealed statistically significant differences of the group means. Anti-White bias motivated incidents were on average not statistically different from Anti-Asian or Anti-Hispanic bias motivated incidents. Anti-Asian, Anti-Hispanic, Anti-Arab, and Anti-other were on average only statistically different from Anti-Black bias motivated incidents.

One-way ANOVA Specific Sexual Orientation Bias Motivation

ANOVA

Number of reported offenses per year

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25464.467	2	12732.233	144.843	.000
Within Groups	2373.400	27	87.904		
Total	27837.867	29			

Tukey HSD				95% Confidence Interval	
(I) Specific Sexual Orientation Bias Type	(J) Specific Sexual Orientation Bias Type	Mean Difference (I-J)	Sig.	Lower Bound	Upper Bound
Anti-gay (male)	Anti-Lesbian	53.400[*]	.000	43.00	63.80
	Anti-other	67.700[*]	.000	57.30	78.10
Anti-Lesbian	Anti-other	14.300[*]	.006	3.90	24.70

*. The mean difference is significant at the 0.05 level.

All group mean comparisons were statistically significant. The mean number of incidents for Anti-gay (male) was statistically significantly higher than the mean number of Anti-Lesbian or Anti-other incidents. The mean number or Anti-Lesbian incidents in turn was also statistically significantly higher than the mean number of Anti-other based bias motivations. The respective group means clearly fell outside of the normal variation for these bias motivations.

Appendix E
One-way ANOVA Specific Religion Bias Motivation

ANOVA

Number of reported offenses per year

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	20833.720	4	5208.430	59.611	.000
Within Groups	3931.800	45	87.373		
Total	24765.520	49			

Tukey HSD					
(I) Specific Religion Bias Motivation	(J) Specific Religion Bias Motivation	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Anti-Semitic	Anti-Catholic	50.300*	.000	38.42	62.18
	Anti-Protestant	53.100*	.000	41.22	64.98
	Anti-Islamic	45.700*	.000	33.82	57.58
	Anti-other religion	53.200*	.000	41.32	65.08
Anti-Catholic	Anti-Protestant	2.800	.962	-9.08	14.68
	Anti-Islamic	-4.600	.805	-16.48	7.28
	Anti-other religion	2.900	.957	-8.98	14.78
Anti-Protestant	Anti-Islamic	-7.400	.403	-19.28	4.48
	Anti-other religion	.100	1.000	-11.78	11.98
Anti-Islamic	Anti-other religion	7.500	.390	-4.38	19.38

*. The mean difference is significant at the 0.05 level.

Above group comparisons depicted that only the mean for Anti-Semitic based bias motivations was statistically different from the means of other religiously based bias incident.

Appendix F
Binary Logistic Regression Models
Violent Crime on Bias Motivation Categories

<u>Dependent Variable:</u>
Violent Offense(s) Occurred during Incident (Yes/No).

<u>Independent Variables:</u>
Anti-Race Ethnicity Bias Motivation Present in Incident (Yes/No)
Anti-Sexual Orientation Bias Motivation Present in Incident (Yes/No)
Anti-Gender Bias Motivation Present in Incident (Yes/No)
Anti-Handicap Bias Motivation Present in Incident (Yes/No)

<u>Reference Category:</u>
Anti-Religion Bias Motivation Present in Incident (Yes/No)

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	AntiRaceEthnicityIndicator	.972	.150	42.203	1	.000	2.644
	AntiSexualOrientationIndicator	.963	.159	36.625	1	.000	2.620
	AntiGenderIndicator	-19.349	9804.518	.000	1	.998	.000
	AntiHandicapIndicator	.847	.416	4.148	1	.042	2.332
	Constant	-2.765	.143	373.981	1	.000	.063
a. Variable(s) entered on step 1: AntiRaceEthnicityIndicator, AntiSexualOrientationIndicator, AntiGenderIndicator, AntiHandicapIndicator.							

-2 log likelihood:	4638.217		
Nagelkerke R^2:	.062		
Model Chi-Square:	168.714	Sig. 0.000	

Appendix G

First, Second, and Third Victim Age Pairings, 2000 - 2009
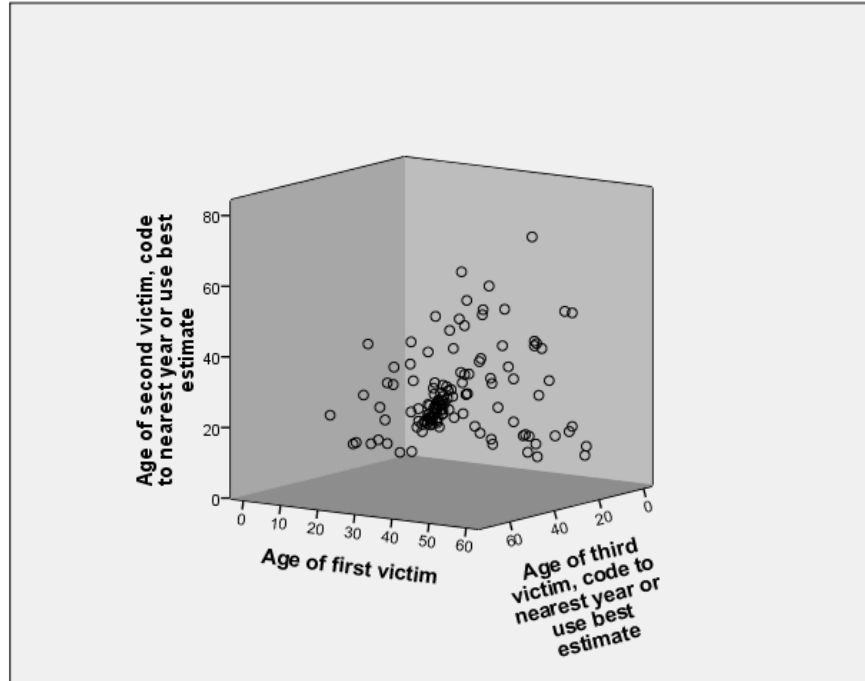
First, Second, and Third Offender Age Pairings, 2000 - 2009